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TECHNOLOGY TRANSFER

DETERMINING INDUSTRY NEEDS:
A GUIDE FOR COMMUNITIES

National Aeronautics and Space Administration
George C. Marshall Space Flight Center
Huntsville, Alabama

A Guide for
Community Technology Transfer

Prepared for

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Foreward

This **Guide** was developed in accordance with the Memorandum of Understanding between the NASA George C. Marshall Space Flight Center and the following States: Alabama, Georgia, Louisiana, Mississippi, Tennessee, West Virginia.

The economic welfare of individual communities is currently a matter of considerable interest. Concern for the position of US industry in the competitive world marketplace is a matter of growing concern as well. This "guide" describes a process whereby communities may seize the opportunity to improve their own economic destiny. The method described involves linking the technology needs of existing industries to the technologies which are available from Federal Laboratories. Community technology transfer is an "action possibility" which allows individual citizen groups to do something tangible to improve the economic climate of the places where they live and work. The George C. Marshall Space Flight Center in Huntsville, Alabama is pledged to promote and encourage such efforts, and stands ready to help communities both large and small in that regard.

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1.0 The Technology Transfer Process—Background

The term technology transfer as used in this guide refers to any action designed to move technologies developed with public funds to the private (industrial) sector.

The NASA Marshall Space Flight Center and other Federal Laboratories are dedicated to sharing their technologies with industries and are willing to take action to achieve that objective.

In order to obtain results, however, the available technologies must meet the needs of industry. This guide is designed to help communities identify individual industry needs on a local basis. The needs essentially fall into two categories:

- Development of *New Products* which are based on new technologies.

- Improvement of *Plant operations or processes* based on the application of new technologies.

The community objective is to take advantage of new technologies to create a climate for *existing industry expansions* and/or *new industry start-ups.*

The Federal objective is to *improve the competitive position* of U.S. industries in the *global economy*.
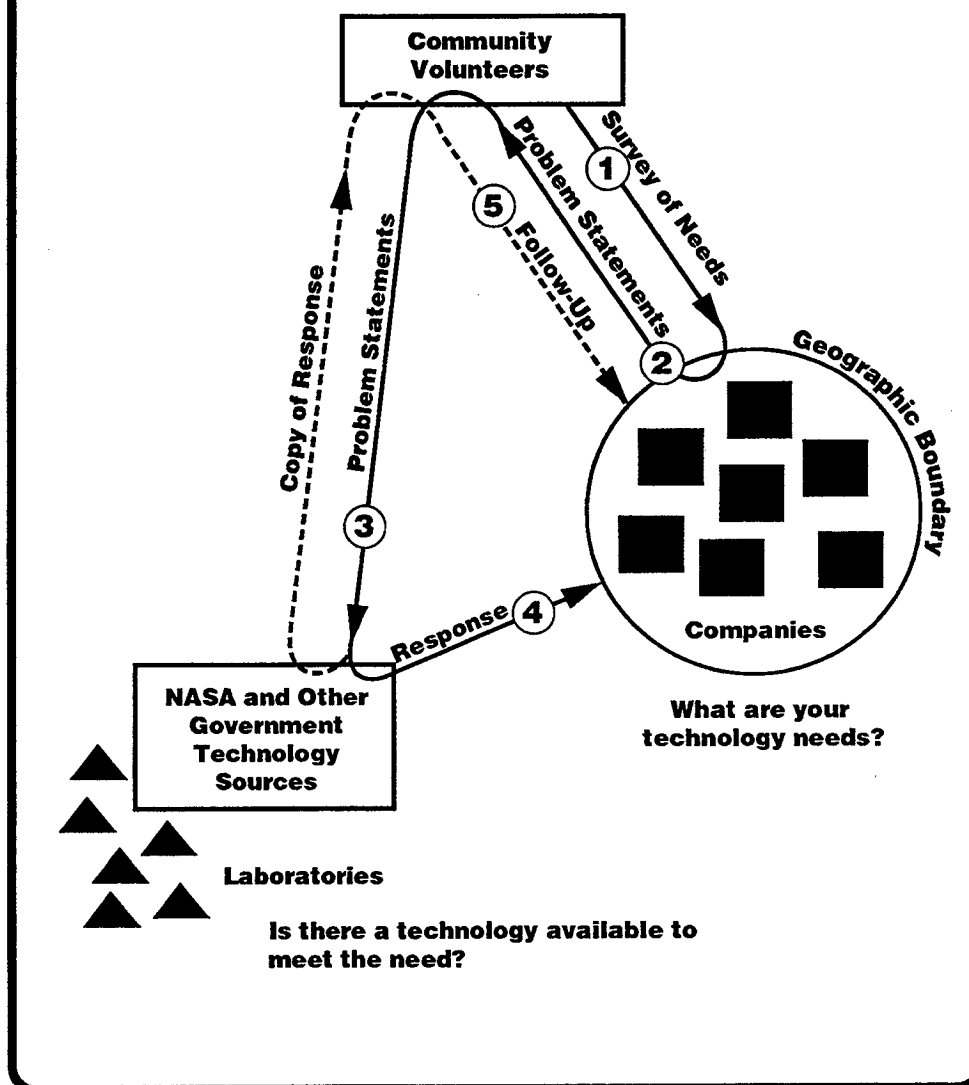
Federal Laboratories are committed to transfer technologies which have been developed with public funds back to the "taxpayer investors." The Marshall Space Flight Center has, over time, engaged in an ongoing effort with this in mind. In order to improve the results, however, a link to industry must be forged. This guide describes the means for establishing that link.

Experience with projects carried out in the State of Tennessee indicates that promising technology transfer results can be obtained if personal attention is given to industry requirements. Such personal attention requires a considerable investment of time and effort. This guide is based on the premise that the work involved can effectively be accomplished by local volunteer groups or organizations (typically chambers of commerce, industrial development groups, etc.).

The recommended method involves calling on individual companies to determine specific technology needs, and distributing those needs in the form of problem statements to appropriate government sources for response. It should be noted that the volunteer force is not expected to solve the problem — only to *identify it*.

The schematic diagram on the following page illustrates how the process works and defines the steps involved in (numbered) sequence.

Community Technology Transfer
Schematic Diagram

Community Volunteers

① Survey of Needs

② Problem Statements

⑤ Follow-Up

Copy of Response

Problem Statements

③

Response ④

Geographic Boundary

Companies

What are your technology needs?

NASA and Other Government Technology Sources

Laboratories

Is there a technology available to meet the need?

With this background in mind this guide may be used as a reference in organizing and implementing a community technology transfer project. Suggestions are provided for local mobilization, field inquiries, priority setting, distributing problem statements to appropriate government agencies, and delivering responses to industries.

Appendix A to this Guide contains a detailed check list of project steps for reference. Appendix B contains sample media releases for announcing the project locally. Appendix C includes forms which can be used to record information obtained during both initial and follow-up industry visits. A system of record keeping for the overall project is also included in Appendix C.

The investment in volunteer time recommended in this guide can be expected to result in tangible economic benefits at the community level. Results may be expected to include existing industry expansions and new industry start-ups. At the same time dependence on the relocation of industries from other geographic regions can be reduced. If such results appeal to the community, this Guide will be a useful tool.

2.0 Analyzing the Local Industry Situation

The size of the technology transfer challenge will vary with each individual community. In small rural communities it is probably best to offer to call on all of the existing companies just to ensure that none are left out. In larger urban locations this may not be possible, at least within a reasonable time period.

In addition to variations in the number of industries present, certain industry types may be dominant in the local economy. In these cases the scope of the work can be narrowed to include industries in specific product areas only (metalworking, wood products, etc.). Another approach to reducing the scope of work to a manageable level would be to spread the industry contacts over a period of time by calling on industries in groups within defined blocks of calendar time. In the latter case the very valuable asset of "volunteer momentum" can be lost if the time period is extended excessively.

In some communities certain industry types may be in "trouble" as evidenced by employee layoffs, loss of market, or other indications. On the other hand certain industry types may be growing and exhibiting significant job creation potential. These possibilities create a decision point of some significance if the industry contacts must be limited in number. The "healthy" industries represent a high potential for technology transfer success. At the same time, the declining industries are in desperate need of help in order to avert collapse. Both of these industry type conditions must be considered in planning industry contacts. Neither should be overlooked.

One effective way of narrowing the field is to invite all local industries to a meeting which is designed to deal specifically with what the companies can expect to gain from technology transfer. (Attendance can be greatly improved if a gracious sponsor can be induced to provide a lunch.) Following the meeting those companies that were in attendance can be listed as the first group to be contacted regarding their technology needs.

The first step then in the Community Technology Transfer Process is the compilation of a listing of industries for contact. All other detailed planning for the work will be based on the character and size of the industrial field.

The listing of industries should include the company name, address, phone, and contact person name. Other data such as number of employees, products, and four-digit Standard Industrial Classification (SIC) number, can be assembled in advance, and if included on the listing will save considerable field time later.

With the industry list in hand the community is ready to mobilize for implementation.

3.0 Mobilizing on the Community Front

Following the preparation of the industry listing, a cadre of volunteer participants should be secured.

Chamber of commerce directors, industrial development board members, technical society members, and civic organization members, are examples of fields where willing volunteers may be found. Anyone with a community interest in economic development and business climate improvement can, in fact, make a valuable contribution as a volunteer.

Potential volunteers can be expected to ask what the prerequisite qualifications might be. It should be pointed out early that technical or engineering experience or skill is not necessary. The Volunteer Field Worker is expected to simply uncover and "name" the technology needs — not to provide technological solutions. The volunteer must therefore be:

- Interested
- Inquisitive
- Observant
- Friendly.

Once the Volunteer Field Workers are recruited, they should be divided into teams. Experience indicates that teams of two are appropriate. Each team can be assigned from four to six industries for contact. It is important, however, to limit the number of industry calls to a maximum of two per day. This provides flexibility in the length of the plant visit (depending upon the interest of the company in each case), and reduces the possibility of missing technical problems due to the large volume of information which is generally provided.

A local Volunteer Coordinator is absolutely essential to the successful pursuit of the project. This person will need to devote considerable time to making appointments in accordance with the schedule requirements of both plant management and volunteer personnel. Experience indicates that this coordination requires continuous attention throughout the field work phase of the project. The Volunteer Coordinator will also be responsible for the assignment of problem statement numbers, the handling of problem statements through the distribution process, and project record keeping. For that reason a person on the staff of a local agency or organization, who can be sanctioned to accomplish the coordination work, is best suited. Banks, utilities, and chamber of commerce organizations can often be counted on to furnish this type of coordination support for the project.

Prior to initiating the field mission the volunteers should participate in a two-part orientation which will be provided by the Marshall Space Flight Center. The appropriate Marshall Space Flight Center Technology Transfer Representative (See Section 7.0) may be contacted to arrange for the required orientation, which will be staged in the community or in Huntsville, Alabama depending upon schedules and logistics. The orientation will include the following:

Part 1: Briefing on field techniques which may be used to gather information on industry technology needs. This step will include suggestions on the use of inquiry forms, prompts for questions to be asked, problem statement writing, problem priority setting, distribution of problem statements to appropriate Government agencies, delivery of responses, and follow-up.

Part 2: Orientation on the types of technologies available at NASA centers. This step can include a one-day visit to the Marshall Space Flight Center in order to view firsthand some "samples" of the types of technologies which would be available. Such visits are desirable since they provide an opportunity for NASA laboratory personnel to emphasize how the available technologies might be applied and used by industry. If logistic factors prevent the scheduling of a visit to the Marshall Space Flight Center information on available technologies can be included in the local briefing.

It should be noted that the transportation and meal expenses associated with the visit described in Part 2 above cannot be absorbed by the Government. It may therefore be desirable to find a local sponsor to cover the transportation and meal costs involved as a matter of civic participation.

Once the orientation activities are completed the field work should be initiated immediately in order to maintain volunteer momentum. A newspaper release and radio announcement should be considered at this point as a means of alerting the industries in the community. Sample media releases which may be modified locally as required and used for this purpose are included in Appendix B.

The information sheet included on the following page is designed to provide a basic definition of the technology transfer process and to indicate the potential benefits in simple terms. This item may be provided to the local press as a background for the project announcement. This same information sheet may be provided to local industries, along with the schematic project diagram included in Section 1.0, as handouts during the initial kick-off meeting with local industries.

The community is now in position to launch the field work phase of the project. The next step represents the very heart and soul of the effort and will require a considerable amount of "community energy".

Technology Transfer

Definition: An action which is designed to move technologies
                         which have been developed with taxpayer funds to
                         the private (industrial) sector.

Local Objective: Establish a technical climate for the creation of
                         high quality jobs through company expansions and
                         new business start-ups.

Federal Objectives: Apply Government developed technology to en-
                         hance the economic position of United States indus-
                         tries in a competitive world economy.

Potential Industry Benefits:

- Reduced operating costs
- Increased profit margin
- Increased market share
- Improved competitive position
- Opportunity for expansion

4.0 Fieldwork–Identifying Technology Needs

The field survey of companies contains only one basic question, "Do you need any new technologies, or do you have any problems which need a technical solution?" Surprisingly most industry management and technical personnel will answer this question with a simple "No!" There are very legitimate reasons for this typical initial response. The following list summarizes the factors which underlie this type of reaction.

- Difficulty in finding time to identify and discuss technology needs which may be long range (as opposed to pressing immediate problems).

- Reluctance to divulge company problems (as related to giving an advantage to competitors).

- Reluctance to admit that present methods need change (as related to risks which go with the implementation of any new concept).

- Reservations as to the cost of implementation of technology improvements (especially during perceived recessionary periods).

- Reluctance to discuss technical company problems with "non-experts" (unfortunate previous experience with "dabbling" governmental agencies).

- Resistance to any potential change which originates outside the company (belief that there is "nothing new under the sun", and lack of trust in approaches which were "not invented here").

There is, however, one very helpful technique which may be used successfully in dealing with the initial negative response indicated above. This "secret weapon" is the *plant tour*. Most company personnel are quite willing, and even enthusiastic, about showing their operations to visitors. Thus, a stroll through the plant will almost always open up the discussion to the point that technology needs will surface. Questioning company personnel on points of this sort while touring the plant is quite appropriate. Experience indicates that a large number of technology needs will be identified by this technique because a first hand look at the production process tends to bring such needs to mind. The Volunteer Field Worker in this situation need only be quick to make notations as the tour progresses.

In order to generate responses from the company with regard to technical problems a series of "prompts" can be helpful. The Industry Inquiry Guidelines included in Appendix C indicate some areas which can be suggested to industrial plant personnel as possibilities. The Guidelines also include notes on some special situations which may be encountered.

Following a review by Marshall Space Flight Center personnel, a search for applicable technologies will be initiated. The company should be assured that their needs will not be discussed with other companies or with the public in the process.

5.0 Problem Statements–Preparation

A Problem Statement "form" for recording technology needs is included in Appendix B. One form must be prepared for *each individual technology need* so that distribution can be made to various appropriate sources for response. A few comments on some of the items included in the format may be helpful at this point:

- **Company Information** (Top Box)

    Much of this information can be filled in from the industry listing which was prepared earlier as described in Section 2.0. The "SIC Nos." are the Standard Industrial Classifications (four digit) for the company and relate to plant products. The SIC is needed for statistical purposes, and as a numeric field has no particular meaning. Thus a brief description of the plant's products in text is called for.

    One of the blocks, Division or Home Office, should be checked since this information provides an indication as to where the decision to install new technologies will be made.

    The Company Information box must be filled in on each individual Problem Statement even though this requires considerable repetition in cases where one company submits multiple problems. The data is required on each problem statement since the forms will be separated for distribution and response by various organizations.

- **Problem Information** (Middle Box)

    The "problem type" should be recorded *using one (or more) of the following descriptive categories:*

    - Production Methods
    - Product Design
    - Machinery/Equipment
    - Byproduct Development
    - Computer Hardware/Software
    - Materials
    - Quality Control
    - Engineering Management
    - Plant Energy Use
    - Waste Disposal
    - Plant Facilities/Utilities
    - Environmental/Safety.

    Each problem should be classified as either a "New Product" technology need or a "Plant Operation" technology need by checking the appropriate box. In general, established existing companies tend to have plant operations needs. Entrepreneurs and entrepreneurial type companies tend to have a greater interest in new products.

    The problem description itself should include background (historical) information related to the problem and the pertinent factors which created the need.

Most companies have probably already tried most of the obvious, low-cost, easy-to-implement solutions. Thus, no "easy answers" are anticipated. In order to avoid duplicating solutions which have already been tried, all such previous attempts should be noted in the "Action to Date" section of the problem statement.

The "Desired Results" section of the problem statement should summarize the problem incorporating as many "key words" as possible in order to facilitate the search for a solution. If possible this section should include information on how much the problem is *presently costing the company* annually. (This cost information will give some idea as to how much the company might be willing to invest in new technology installation.) In the case of "new product" type problems, the amount of money the company would be willing to *spend in product development* should be indicated if known.

Since the generation of a response to a technology need can take a considerable amount of time, the success possibilities are much greater for "long term" needs than for short lead time emergencies. For this reason the company schedule requirements should be shown in the "Response Schedule Required" section of the problem statement.

If the company would like a return visit by a responding laboratory the "Return Visit Requested" box should be checked. This provides an indication of the "receptivity" of the company in terms of pursuing a solution jointly with Marshall Space Flight Center "experts".

■ **Volunteer Information** (Bottom Box)

The Volunteer Field Worker should show his name and telephone number in this section in order to provide a means for dealing with possible questions and to facilitate arrangements for return visits.

Once a problem statement has been prepared it should be assigned a three digit number by the Volunteer Coordinator and sent back to the company with a request that it be checked for accuracy and completeness. A self addressed stamped envelope should be included in this transmittal for the convenience of the company in returning the marked up (corrected) Problem Statement. It is suggested that problem statements which are not returned should be closed without further action since the lack of response generally indicates a limited interest on the part of the company. The volunteer may, however, pursue the problem at his discretion depending upon the situation.

Once a few problem statements have been returned they should be assembled for a final local screening. Priority setting activities are discussed in Section 6.0. Generally it is best to handle Problem Statements in small batches as they are returned, rather than waiting until the end of the field work phase of the project to move them along.

6.0 Setting Priorities and Determining "Receptivity"

The significance of a technology need or problem, and the receptivity of a company should be determined in each case as a means of indicating the priority to be applied by the responding organization.

Experience indicates that all technology needs are not created equal. Neither do all companies have the same level of interest in the technology transfer process. A numeric system for indicating *"problem significance"* (S-Code) has been developed along with a companion system for *"company receptivity"* (R-Code). The two following pages provide information on the numeric scale for both systems, and also provide suggestions on how to decide the values. Companies receive an R-Code, and problems receive an S-Code. Admittedly the assignment of numeric values is "judgmental". Even so the values are useful for determining priorities by comparison with each other.

The Volunteer Coordinator should assign all S-Code and R-Code values in consultation with the individual Volunteer Field Worker who made the initial personal plant visit. This action should involve a consensus, and can in most cases be accomplished by phone. R-Codes and S-Codes should be recorded in the project record keeping system described in Section 9.0.

In assigning S-Codes the Volunteer Coordinator should scan the field of problems to identify "common problems". Should a pattern emerge as a result, the S-Code of the problems which are *common* can be raised to reflect the fact that meeting such needs can have considerable community impact.

Finally the local volunteers should decide what actions will be taken in accordance with the R-Code and S-Code values in each case. A local decision could be reached, for example, stating that only those problems with R-Codes of 2 or more and S-Codes of 2 or more would be distributed for response. At the same time a decision could be reached to label all problems with R-Codes of 5 and S-Codes of 4 or more as *"priority"* problems. Such problems could in turn be recommended to involve plant visits by Marshall Space Flight Center personnel and pro-active follow-up action by the community.

Once R-Codes and S-Codes have been assigned, the individual problem statements should be distributed for response.

Problem Significance

(S CODE)

5 = Highly Significant

4 = Fairly Significant

3 = Somewhat Significant

2 = Slightly Significant

1 = Not Significant

The following criteria may be used to determine the significance of the problem:

■ Is it a "universal" industry-wide problem with national economic implications?

■ Is it a serious local industry problem with jobs at stake?

■ Is there a possibility for achieving an innovative solution to the problem?

■ Is the problem a pressing issue as far as the future of the company is concerned?

■ If the problem were solved would the community impact be large or small?

Company Receptivity

(R CODE)

5 = Highly Receptive

4 = Fairly Receptive

3 = Somewhat Receptive

2 = Neutral

1 = Not Receptive

The following criteria may be used to determine the receptivity of the company:

- ■ Is the company willing to invest money to find a solution to the problem?

- ■ Is the company willing to put time into an effort to solve the problem?

- ■ Is the company willing to honestly recognize and confront the problem?

- ■ Is the company "friendly" in terms of welcoming "outsider/experts" to the problem solving process?

- ■ Does the company believe that the problem can actually be solved by the application of new technologies?

7.0 Distribution of Problem Statements

All *technical* problem statements should be sent to the appropriate "Technology Transfer Representative" at the Marshall Space Flight Center:

State	MSFC Representative	Phone	Fax
Alabama	Mr. Roger Black	205–544–5820	205–544–3151
Georgia	Mr. Bob Minor	205–544–5821	205–544–3151
Louisiana	Mr. Roger Black	205–544–5820	205–544–3151
Mississippi	Mr. Bob Minor	205–544–5821	205–544–3151
Tennessee	Mr. John Cranston	205–544–2766	205–544–3151
West Virginia	Ms. Wanda Randolph	205–544–5819	205–544–3151

Problem Statement transmittals should be forwarded to the above Technology Transfer Representatives at the following address:

> Technology Transfer Office
> Mail Code AT01
> Marshall Space Flight Center
> Huntsville, AL 35812

The Marshall Space Flight Center "Technology Applications Board" (TAB) will review the problem statements as they are received, will assign responsibility for the problem to a specific individual, and will make a distribution of the problems to their appropriate laboratories for review and response. The TAB consists of Marshall Space Flight Center personnel and NASA prime contractors. The Southern Technology Applications Center (STAC), and the Federal Laboratory Consortium (FLC) also participate in the problem statement review process.

The Marshall Space Flight Center will also make a secondary distribution of selected problem statements to other NASA Centers which might possess the required expertise. The objective in all cases will be to strike a match between the technical need and an applicable available technology. Should no response (or a negative response) be received within a reasonable period of time the Technology Transfer Representative will inform the Volunteer Coordinator and discuss the status of the search.

If a University Research Laboratory, or another State or Federal Laboratory is within or near the community, and if such laboratories have an interest in technology transfer, problems may be referred to them by the Volunteer Coordinator directly. This method will of course only involve those problems which match the focus of the research being carried out at such locations. This type of distribution may, however, be made at the same time the problem is forwarded to the Marshall Space Flight Center on the chance that two alternative solutions may be produced for consideration by the company involved.

As technical solutions are identified the local volunteers can be reactivated as needed as participants in the delivery of the responses.

8.0 Delivery of Responses to Industry

Once the Marshall Space Flight Center locates a technology which matches a problem, the laboratory may make *direct* contact with the industry involved. Note that there is no need to filter this contact through the Volunteer Coordinator or Volunteer Field Worker since the involvement of a "middle man" at this point would not be expected to accelerate the process.

This first contact will very likely consist of exploring *technical questions* which the laboratory will have with regard to the problem itself. This interaction will often indicate that a visit to the industry by technical personnel will be beneficial as a means of pursuing a solution. It is suggested that the Volunteer Field Worker responsible for the initial inquiry be asked to assist in making arrangements for plant visits, and join the technical team in cases where such plant visits are made.

Responses may consist of one or more of the following:

- Readily available published information
- Specially prepared written information
- Expert personal assistance by phone
- Expert personal assistance at the plant site
- Visits to Federal Laboratories by industry personnel.

The Technology Transfer Representative for the state involved will participate in the delivery of responses which are developed by NASA Laboratories, and will provide information on all contacts to the Volunteer Coordinator so that the progress on the work can be tracked locally.

Even though a conscientious effort is made to keep up with project developments, it is possible that some response actions taken will be unknown to the Technology Transfer Representative and the Volunteer Coordinator. Thus it is suggested that the Volunteer Coordinator refer to his project record (described in Section 10.0) and contact all of the industries which have not received a response within 60 days of the date of the initial plant visit. If the industries in this category confirm that they have not received any response, it is suggested that the Volunteer Coordinator discuss the search with the Technology Transfer Representative in order to evaluate the chances for achieving a technology match, and report the results of the discussion to the company.

9.0 Technology Transfer Record Keeping

It is suggested that the Volunteer Coordinator record progress on a periodic basis. Appendix B includes a suggested Project Record format which may be used for this purpose. The record keeping system would involve maintaining a one page record of this type for each problem. The information on status and actions taken to date may be obtained locally by contacting the company involved, and/or by discussing the status with the Technology Transfer Representative.

The Project Record form is designed to be maintained manually (handwritten entries). If the scope of the local project is large (involving for example more than 100 problem statements) it might be well to consider setting up the format as a computer spreadsheet, and maintaining the records by keyboard entries. Local capabilities in computer operations will be a factor in deciding whether a manual or computerized record keeping system will be best.

Some statistical analysis of the project would be helpful following its completion. The identification of the dominant *problem types* as related to certain *industry types* would for example be of interest as guidance for other communities in terms of what to look for. This same information would be of importance locally in selecting areas for technology transfer concentration. For these reasons it is suggested that the standard record keeping form shown in Appendix B be used, and that copies of the completed form sets be provided to the Technology Transfer Representative on a periodic schedule as they are updated.

The record keeping form has a place to record the "proposed follow-up date" in the top box. This date should be assigned when the form is initially filled out, and should be treated as a pending action item. A local decision can be made as to how much time should be allowed between the initial plant visit and the follow-up visit. (A range of from six to eight months would probably be about right). The Volunteer Coordinator may need to remind the Volunteer Field Workers in advance of the follow-up dates so that the visits can be scheduled conveniently. Suggestions for carrying out these visits are included in Section 10.0.

10.0 Follow Up—What Did We Accomplish?

A follow-up plant visit should be made to each company in order to determine whether any progress has been made. This is not to suggest that a technology transfer should have been completed between the time of the initial and follow-up visits, but rather that some type of response to the identified need should have been received by the company within that time period.

The suggested follow-up action has two important purposes. First, it obviously indicates whether anything actually happened, and provides a basis for further action. Second, it tells the companies that they have not been forgotten even in those cases where a technology transfer has not occurred.

As previously indicated, the follow-up should be scheduled for a date which is from six to eight months after the initial visit. In order to maintain continuity the same Volunteer Field Worker that made the initial visit should do the follow-up. When making the follow-up visit, it will be helpful if the Volunteer will carry along copies of the problem statements for that particular company as background and as a reminder of the technology needs which were identified originally.

A format for conducting a follow-up visit and recording the results is included in Appendix B. Responses to the identified company needs could have occurred in a variety of ways. The follow-up form provides a system for recording these various response actions and goes on to basically tell the story of what happened.

The follow-up caller should be alert to two changes which may have occurred at the company since the time of the initial visit:

- **Company operational changes** including the installation of new equipment, introduction of new products, acquisition of new customers and loss of old ones, compliance with new regulations, etc.

- **Company organizational changes** including rearrangement of the management system and changes in management and technical personnel.

If a changed situation is encountered, the Volunteer Field Worker will need to consider the effect on the technology transfer issues at hand. If new personnel are involved a "new start" may be required and the history of the project may need to be reviewed. If processes and operations have changed, the initially stated technology needs may no longer exist. Those needs may, in fact, have given way to new ones, and new problem statements may be prepared accordingly.

The technology transfer process is extremely fluid, especially in the case of an aggressive growing company. The Volunteer should therefore be alert to new technology needs, and should make a practice of recording such needs as they are discovered during the follow-up. A new "secondary" series of problem statements can then be prepared.

The Volunteer Coordinator should discuss each follow-up with the Volunteer Field Worker after each visit, and should in turn record the results in the Project Record system. The Coordinator can at that point also institute a new round of priority setting and problem statement distribution for the additional needs identified during follow-up.

11.0 Summary/Conclusion

The tendency for change, and the experience gained in earlier demonstration projects, suggest that once a community technology transfer project is started it will never really end. *In technology transfer there is no finish line.* This fact can be quite sobering, in that it leads to the conclusion that **continuing work will be required**. Community **endurance** thus becomes a factor in the success of the process.

With the long-term situation in mind then, the Marshall Space Flight Center is committed to a lasting partnership with every participating community. In that regard the communities are invited to call on their Technology Transfer Representative for support. The community will find the Marshall Space Flight Center administrative and management staff devoted to the cause as well, since they consider the community effort to be an activity which directly supports their own mission.

Communities desiring to initiate a Technology Transfer Program are invited to submit their written request for support to the Marshall Space Flight Center at the following address:

> Mr. Ismail Akbay, Director
> Technology Transfer Office
> Mail Code AT01
> Marshall Space Flight Center
> Huntsville, AL 35812
>
> Phone: 205–544–2223

The Marshall Space Flight Center will assist in the start-up of a Technology Transfer Project in any community (or group of communities) in any of the states which have a "Memorandum of Understanding" in effect. This start-up assistance would emphasize the orientation of the local volunteer force. Each identified technology need will be the subject of a diligent search for solutions. Along the way additional support to the community will be provided on request.

A check list of Project Steps is included in Appendix A for quick reference and as a guide to ensure that important actions are not overlooked as the work proceeds.

Appendix A
Project Check List

Community Technology Transfer Project Check List

The following outline lists the steps which should be taken in carrying out a Community Technology Transfer Project, and will serve as a guide in the implementation of such projects.

I. **Preparation of industry listing**
    A. Selection of industries for contact
        1. *All* Industries in local area?
        2. Dominant industry types only?
        3. "Troubled" sectors for special emphasis?
        4. "Non-manufacturing" types
            a. Mining
            b. Agriculture
            c. Forestry
            d. Transportation
            e. Construction

    B. Company identification data
        1. Name/Address
        2. Person to contact
        3. Products and SIC
        4. Size (Employment)

II. **Community Mobilization**
    A. Acquisition of volunteers
        1. Chamber of commerce members
        2. Industrial and economic development organizations
        3. Civic organizations
        4. Technical societies

    B. Selection of Volunteer Coordinator

    C. Assignment of Volunteers
        1. Team pairings
        2. Industry assignments

    D. Volunteer orientation
        1. Local orientation
            a. Inquiry procedures and use of form
            b. Problem statement preparation
            c. Priority setting
            d. Problem statement distribution
            e. Delivery of responses
            f. Follow-up
        2. MSFC Laboratory Visit
            a. MSFC Technology Transfer background
            b. Observation of available technologies

III. **Project Start up**
A. Media coverage
    1. Newspaper release
    2. Radio announcement

B. Industry kick-off meeting

IV. **Industry visits**
A. Emphasis on benefits to industries

B. Identification of technology needs (plant tour)
    1. Technical plant operating problems
    2. New products based on new technologies

V. **Problem statement preparation**
A. Company information

B. Problem information
    1. Problem description
    2. Action to date
    3. Desired results
    4. Response schedule required

C. Volunteer identification information

D. Industry review of problem statements

VI. **Priority setting**
A. Assignment of S-Codes (problem significance)

B. Assignment of R-Codes (company receptivity)

C. Common problem identification

D. Priority problems
    1. Selection of problems for emphasis
    2. Policy for handling priority problems

VII. **Distribution of problem statements**
A. Problem statements to NASA Technology Transfer Representative

B. Problem statements to other laboratories

VIII. **Delivery of responses**
A. Reactivation of volunteers

B. Participation by volunteers
    1. Plant visit appointments
    2. Plant visit participation

C. "No response" cases (over 60 days)
    1. Discuss with Technology Transfer Representative
    2. Report status to company

IX. Maintenance of project record

A. Select manual or computer method

B. Record project actions

C. Look for patterns (common problems)
1. Problem type
2. Industry type
3. Combinations

D. Follow-up arrangements
1. Pending dates
2. Volunteer Field Worker notification

X. Industry follow-up

A. Plant re-visits by volunteers
1. Record technology transfer actions
2. Note technology transfer results
3. Note changes
   a. Operations
   b. Personnel
4. Note new technology needs

B. Prepare record of follow-up

C. Enter follow-up information in project record

XI. Initiate and carry out "second effort"
1. Prepare new problem statements
2. Set priorities
3. Distribute new problem statements
4. Deliver responses to new problems

Sample Press Release

Joint Technology Transfer Project Planned Here

(Sponsor) is teaming up with NASA on a project designed to help **(City/County)** industries with technology needs, **(Leader/Spokesperson)** said today.

"We are joining NASA's Marshall Space Flight Center in launching a community technology transfer project that we think will have a positive impact in our area," **(Leader)** said.

The transfer of technologies can benefit area companies through reduced operating costs, increased sales and market share, and improved competitive position, **(Leader)** said.

Ismail Akbay, Director of the Technology Transfer Office at NASA's Marshall Space Flight Center in Huntsville, Ala., said that new technologies developed with government funds will be made available to local industries through this project.

"The new technologies can be used in plant operations or in the development of new products," Akbay said.

(Leader) invited all local industries to send a representative to the project kick-off meeting at **(time)**, **(date)** in the **(place)**. Lunch will be provided at the meeting as a public service by **(lunch sponsor)**.

Area volunteers will visit local companies to work with plant technical and management personnel in identifying and recording specific technology needs in each case, according to **(Leader)**.

Volunteers participating in this project include **(volunteers)**. **(Volunteer coordinator)**, as coordinator, will arrange for visits to the company.

The Marshall Space Flight Center will search for technologies that match the needs indicated by the companies and will make direct contact to deliver the findings of the search, **(Leader)** said.

Marshall Center's technical staff will be available to make personal visits to companies in cases where the delivery of the response can best be handled in this way.

Sample Radio Announcement

Technology Transfer Project Planned Here

(Leader) today announced a joint program designed to help **(City/County)** industries with technology needs. **(Leader)** said **(Sponsor)** will work with NASA to transfer technologies to benefit area companies. **(Leader)** said a kick-off meeting is scheduled for **(Time), (Date), (Place)**. **(He/She)** urged local companies to send a representative to the meeting.

New technologies developed with government money will be made available to local industries through the joint project, a NASA spokesman said.

Ismail (Ish-mail) Akbay (Ahk-bay)—who heads NASA's Technology Transfer Office at Marshall Space Flight Center in Huntsville, Alabama—said the new technologies can be used in plant operations or in developing new products.

Local volunteers will work with plant management and technical personnel to identify specific technology needs **(Leader)** said. The technical staff from NASA's Marshall Space Flight Center, also will be available to visit companies **(Leader)** said.

(Leader) said companies in our area can benefit from this Technology Transfer Project through **reduced operating costs—increased sales—and improved competitive position.**

Persons interested in learning more about this new project with NASA may call **(Number)** for more details.

Technology Transfer Project
Industry Inquiry Guidelines

SUGGESTED QUESTIONS:

Do you have any technology needs in any of the following operational areas of your plant?

Production Methods	Product Design
Machinery/Equipment	Byproduct Development
Computer Hardware/Software	Materials
Quality Control	Engineering Management
Plant Energy Use	Waste Disposal
Plant Facilities/Utilities	Environmental/Safety

Do you have any ideas for *new products* which could be produced in your plant and which would be based on new technologies?

NOTES:

Even though the inquiry is concerned with technical needs, companies will sometimes indicate problems in non-technical areas (administrative, managerial, financing, marketing, personnel, etc.). In these cases it is suggested that the non-technical needs be recorded and sent on to the nearest SBA Small Business Development Center (or other similar business assistance organization) for response.

Problems which call for a comparative evaluation of competing commercial products or services cannot be accepted by Federal Laboratories.

Problems which may be solved by private consultants, or by providers of standard commercial products or services should not be distributed to Federal Laboratories.

Technology Transfer Project
Problem Statement No. _____

County _____
Plant Visit Date _____

Company Name_____
Address_____
_____
_____
        Contact Person _____
No. of Employees_____   SIC Nos.
Company Product(s)

❑ Division
❑ Home Office

Phone _____
Fax _____

Title _____

SIC Nos. _____ _____ _____ _____

❑ Plant Operations
❑ New Product

Problem Type _____

Problem Description (Include background information and full explanation):

Action to Date (Describe what has already been done):

Desired Results (Summarize what is needed for a satisfactory outcome):

Response Schedule Required (When are results needed):

Use additional sheets if necessary

❑ Return visit requested

Initial Plant Visit By: _____   Phone: _____

**Technology Transfer
Project Record**

County _____

State _____

Problem Statement No. _____ Problem Type: _____

Company: _____ Problem Summary: _____

Contact: _____ _____

SIC: _____   _____   _____   _____ _____

Employees: _____ S Code: _____ R Code: _____ _____

Initial Visit Date _____/_____/_____

Initial Plant Visit By: _____ Proposed Follow-up Date: _____/_____/_____

Referred To: On: Problem Status: Date:

1. _____ ____/____/____ ❏ Response Pending   ____/____/____

2. _____ ____/____/____ ❏ Response Provided   ____/____/____

3. _____ ____/____/____ ❏ Closed/Solved   ____/____/____

4. _____ ____/____/____ ❏ Closed/Unsolved   ____/____/____

5. _____ ____/____/____ ❏ Other: _____ ____/____/____

Project Actions Completed:

Technology Transfer Project
Industry Follow-Up

Company Name _____   ❏ Division
Address _____   ❏ Home Office
_____   Phone _____
_____   Fax _____
Company Contact Person _____   Title _____

Were you contacted by MSFC personnel regarding your technology needs?   ❏ Yes   ❏ No

Was the response helpful?   ❏ Yes   ❏ No

Was the response timely?   ❏ Yes   ❏ No

What type of assistance did you receive:

❏ Published information   ❏ Specially prepared written information

❏ Expert personal assistance by phone   ❏ Expert personal assistance at your plant site

❏ Invitation to visit Federal Laboratories   ❏ Other: _____

Do you plan to use any new technologies provided through this program?   ❏ Yes   ❏ No
If so, please describe the technology involved:

What effect will the new technology have on your plant:

❏ Reduced operating costs   ❏ Increased profit margin

❏ Increased market share   ❏ Introduction of new product

❏ Improved competitive position in U.S.   ❏ Improved global competitive position

❏ Opportunity to expand operation   ❏ Opportunity to hire new employees

❏ Opportunity to raise employee pay   ❏ Other:

Please describe any obstacles to the use of the new technology:

Estimated initial cost of installing new technology $ _____
Estimated "payback time" for break even   _____ mo.

Initial Plant Visit By: _____   Date _____   No. of Employees _____
Follow-up Survey By: _____   Date _____   No. of Employees _____